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UPPER WINDS AT NICOSIA (CYPRUS)

By J. DURWARD, M.A.

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UPPER WINDS AT NICOSIA (CYPRUS).

By J. DURWARD, M.A.

The island of Cyprus occupies an important position on the direct air route from Athens to the East, and on account of the importance of upper wind information for the sea-crossing, Haifa to Athens, a pilot-balloon station was opened at Nicosia in 1934. The observations were made by an official of the Public Works Department about 0700 G.M.T. daily, and the results sent to the Meteorological Office, Heliopolis, by wireless.

The following description of the pilot-balloon site at Nicosia has been supplied by the Director of Public Works, Cyprus. The meteorological station at Nicosia (Lat. 35° 9′ 20″N., Long. 33° 21′ 55″E.) is situated on a low flat hill to the south-east of the main Government Offices at a height of 536 ft. above mean sea level. The west side of the hill is surrounded with eucalyptus trees growing on and at the foot of the slope. During the winter with an E. wind, balloons are occasionally lost to view behind these trees after the sixth or eighth minute. The east side of the hill is quite clear.

Some account of the upper wind regime over Cyprus is desirable, and the following discussion relates to the observations made in 1934 and 1935. It is thought that the pressure distribution over Cyprus is sufficiently well defined and sufficiently constant to warrant the discussion of such a short series of observations.

The region of Cyprus is nearly always one of relatively low pressure. This is probably largely due to the surrounding land masses of Asia Minor and Syria ; the sea-level isobars nearly always run parallel to the coast line—east-west along the Asia Minor coast becoming north-south along the Syrian and Palestine coast. The charts of average pressure for January and July, taken with slight modification from the charts in " Zum Klima der Turkei ", are reproduced in Figs. 1 and 2. These may be taken as representing winter and summer conditions respectively. In January the chart shows a definite closed circulation around a minimum of 1017 mb., but in July the low is much less pronounced and consists of an extension towards the Aegean of the great summer low over Asia.

It is thus apparent that, during winter, winds at Nicosia will be fairly well distributed around the compass where as in summer north-westerly winds will predominate. As a matter of fact, at all seasons winds are much more frequent between west and east through north than they are between west and east through south. This in winter may be partially explained as due to the absence of observations in rainy south-westerly winds, but the real explanation seems to be that the centre of low pressure or the axis of the low pressure trough lies more often to the east and south of Nicosia than to the west or north.

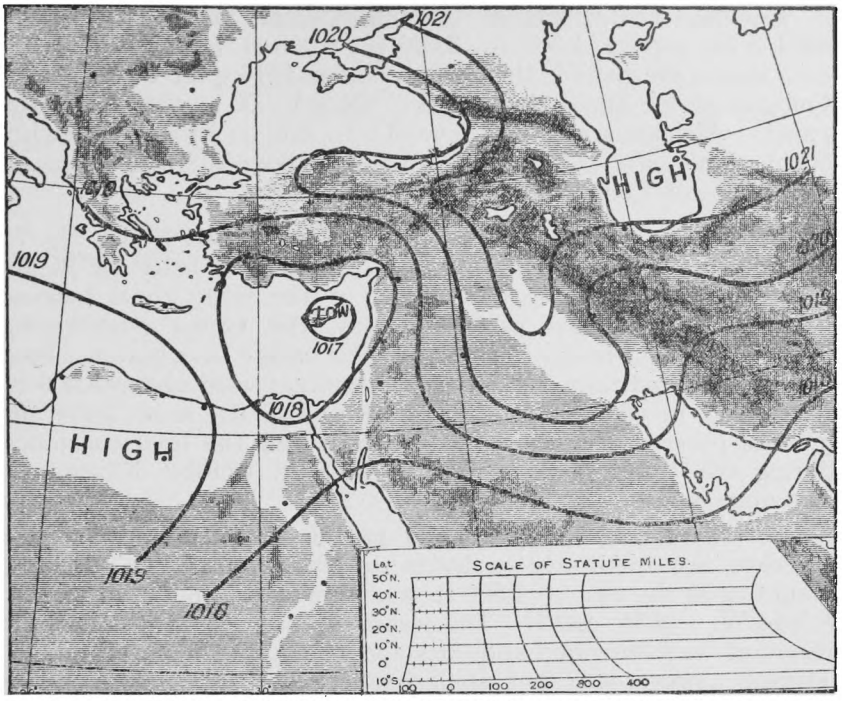

FIG. 1—AVERAGE PRESSURE DISTRIBUTION—JANUARY.

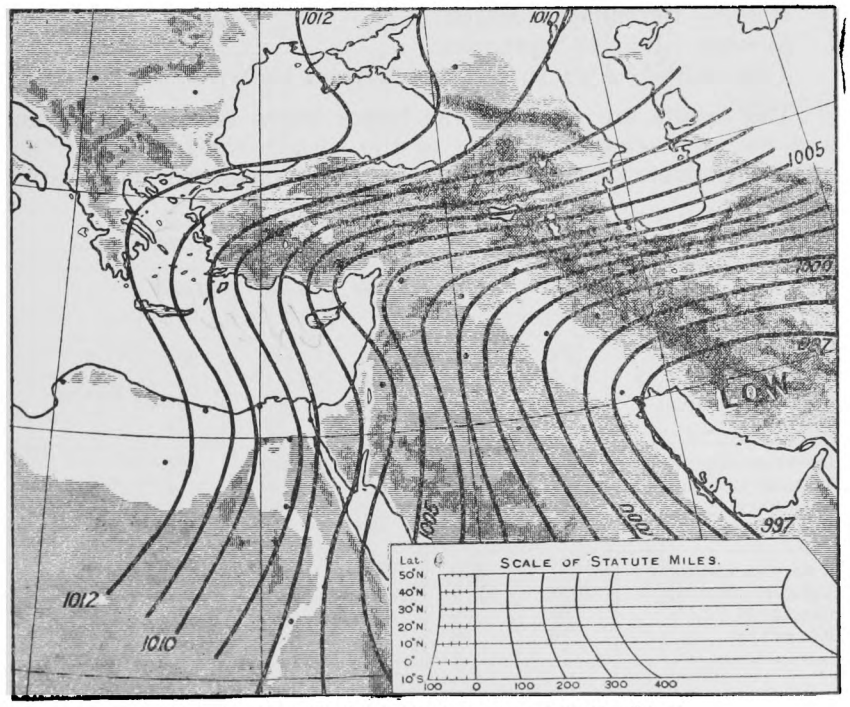

FIG. 2—AVERAGE PRESSURE DISTRIBUTION—JULY.

Results.—The results of the observations for the two years 1934–5 for surface, 1,500 ft., 3,000 ft., 6,000 ft. and 10,000 ft. for each month are given in the form recommended by the International Commission for Aerial Navigation (Tables V—X at the end of the paper). Heights are given above M.S.L., and as Nicosia is roughly 500 ft. above sea level the height of 1,500 ft. above M.S.L. corresponds to a height of 1,000 ft. above the ground.

Discussion.—The method adopted in Professional Notes, No. 72 for representing the results for Wadi Halfa is of little use in the case of Nicosia because, on account of the fairly equal balance between westerly and easterly winds, the vector representing direction is about zero. Diagrams of this nature have however been constructed, and they show that the resultant wind above 5,000 ft. is westerly in all months; that above 5,000 ft., winds have the greatest constancy in the winter months and the least constancy during the transitional months (April–May, October–November). The diagrams are represented in Figs. 3–14.

For the successful application of the above method, it has therefore been necessary to divide the observations into 4 groups according as the wind at 1,500 ft. was between N. and E, E. and S., S. and W., and W. and N. This was done for every month, and the resultant wind direction and constancy calculated for each height. There is however sufficient similarity between the results to justify the combination into periods corresponding roughly with the seasons.

Winter—December to March.
Summer—June to September.
Transitional—April to May and October to November.

The results are given in the tables below for each quadrant and for each season. Instead of the surface wind, which is not always available and which is less accurately measured than at other

TABLE I.—WINDS BETWEEN WEST AND NORTH

	1,000 ft.	1,500 ft.	3,000 ft.	6,000 ft.	10,000 ft.	
Direction (degrees)	305	316	327	318	301	Winter
Velocity (m.p.h.) ..	10·0	12·5	15·9	14·1	17·0	
Constancy (%) ..	92	63	56	43	63	
No. of Obs. ..	57	57	57	42	27	
Direction (degrees)	302	311	321	303	321	Summer
Velocity (m.p.h.) ..	8·7	9·7	11·0	10·9	11·5	
Constancy (%) ..	90	87	63	55	45	
No. of Obs. ..	82	82	82	68	44	
Direction (degrees)	301	309	322	289	255	Transitional
Velocity (m.p.h.) ..	10·3	11·0	11·3	12·1	13·3	
Constancy (%) ..	94	85	58	43	37	
No. of Obs. ..	76	76	76	57	36	

TABLE II.—WINDS BETWEEN SOUTH AND WEST

	1,000 ft.	1,500 ft.	3,000 ft.	6,000 ft.	10,000 ft.	
Direction (degrees)	241	255	270	287	291	Winter
Velocity (m.p.h.) ..	9·1	12·1	14·8	17·4	16·9	
Constancy (%) ..	92	70	53	71	98	
No. of Obs... ..	33	33	33	23	10	
Direction (degrees)	251	228	231	273	267	Summer
Velocity (m.p.h.) ..	6·5	6·9	8·6	11·9	18·5	
Constancy (%) ..	99	65	72	86	(100)	
No. of Obs... ..	16	16	16	12	4	
Direction (degrees)	241	230	261	289	352	Transitional
Velocity (m.p.h.) ..	7·1	9·6	17·7	20·4	13·3	
Constancy (%) ..	98	65	44	34	(44)	
No. of Obs... ..	13	13	18	10	6	

TABLE III.—WINDS BETWEEN SOUTH AND EAST

	1,000 ft.	1,500 ft.	3,000 ft.	6,000 ft.	10,000 ft.	
Direction (degrees)	119	118	129	232	275	Winter
Velocity (m.p.h.) ..	8·0	9·9	11·9	15·8	16·6	
Constancy (%) ..	94	79	50	48	77	
No. of Obs... ..	46	46	44	35	18	
Direction (degrees)	110	113	68	314	259	Summer
Velocity (m.p.h.) ..	5·1	5·7	7·2	10·1	10·9	
Constancy (%) ..	96	76	23	43	58	
No. of Obs... ..	48	48	48	35	16	
Direction (degrees)	116	121	135	203	287	Transitional
Velocity (m.p.h.) ..	8·5	10·3	12·8	12·4	15·7	
Constancy (%) ..	96	85	51	27	54	
No. of Obs... ..	39	39	37	27	18	

TABLE IV.—WINDS BETWEEN NORTH AND EAST

	1,000 ft.	1,500 ft.	3,000 ft.	6,000 ft.	10,000 ft.	
Direction (degrees)	62	63	78	169	268	Winter
Velocity (m.p.h.) ..	10·1	13·7	14·7	13·2	13·9	
Constancy (%) ..	91	80	77	29	53	
No. of Obs... ..	58	58	56	47	26	
Direction (degrees)	56	51	32	12	284	Summer
Velocity (m.p.h.) ..	5·8	6·3	9·5	9·3	11·9	
Constancy (%) ..	90	79	41	52	41	
No. of Obs... ..	55	55	55	41	30	
Direction (degrees)	52	58	65	156	308	Transitional
Velocity (m.p.h.) ..	8·0	9·8	12·0	10·6	12·9	
Constancy (%) ..	92	84	69	25	77	
No. of Obs... ..	33	33	33	23	12	

heights, the wind at 1,000 ft. above sea level, i.e. 500 ft. above the ground, has been analysed. These tables (I–IV) might indicate that the distribution of wind in the four quadrants is more even than it actually is. Thus in winter although at 1,000 ft. there are 57 observations between west and north and 46 between south and east the resultant direction in the first case is 305°, i.e. predominantly westerly and in the other case 119° or predominantly easterly. The same remark applies to winds between south and west (resultant 241°) and to winds between north and east (resultant 62°).

Apart from the value of these tables in representing in a concise form the variation of different winds with height the main points of interest are :—

(*a*) In all seasons westerly winds (*see* Table II) tend to veer with height and increase in velocity. The veering in the transitional season is sometimes very marked, the wind becoming north-easterly on occasions.

(*b*) The change of direction of north-westerly winds (Table I) is much less marked ; in the transitional season there is a pronounced backing to 255° at 10,000 ft.

(*c*) In all seasons easterly winds, Tables III and IV, become westerly by 10,000 ft. ; the height at which the change occurs varies considerably but is very often below 6,000 ft. Thus for wind between S. and E. at 1,500 ft. the resultant directions at 6,000 ft. in the three seasons are 232°, 314° and 203° which indicate that the change from east to west has taken place at some lower height. The behaviour of westerly and easterly winds over Cyprus is thus similar to the behaviour of these winds in many other parts of the world.

TABLE V.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 JANUARY 1934–5 N.	NE.	E.	SE.	S.	SW.	W.	NW.	0700 FEBRUARY 1934–5 N.	NE.	E.	SE.	S.	SW.	W.	NW.
	Surface (39 ft. above ground). 0–3 m.p.h. 2. Total cases 50								Surface (39 ft. above ground). 0–3 m.p.h. 5. Total cases 47							
m.p.h.																
4 – 15 ..	4	5	13	5	..	2	3	1	3	1	7	1	3	2	10	6
16 – 31 ..	2	1	6	..	..	..	5	..	1	..	1	1	1	..	4	1
32 – 47 ..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	11·3	11·2	13·0	7·4	..	7·0	18·9	4·0	8·2	4·0	9·7	10·5	12·7	5·0	12·3	9·4
Total ..	6	6	19	5	..	2	9	1	4	1	8	2	4	2	14	7
	1,500 ft. 0–3 m.p.h. 2. Total cases 55								1,500 ft. 0–3 m.p.h. 5. Total cases 47							
m.p.h.																
4 – 15 ..	3	11	9	1	2	1	3	1	4	3	4	5	3	..	8	4
16 – 31 ..	2	2	9	1	..	..	4	..	1	..	1	..	..	1	6	..
32 – 47 ..	..	..	1	..	..	..	3	..	..	..	..	..	..	..	1	1
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	14·4	10·7	11·7	14·0	6·0	10·0	24·7	5·0	10·4	6·7	12·2	8·6	9·3	19·0	17·1	12·6
Total ..	5	13	19	2	2	1	10	1	5	3	5	5	3	1	15	5
	3,000 ft. 0–3 m.p.h. 1. Total cases 52								3,000 ft. 0–3 m.p.h. 1. Total cases 47							
m.p.h.																
4 – 15 ..	2	9	8	3	1	1	1	2	3	4	4	4	3	5	4	1
16 – 31 ..	1	..	6	3	..	2	6	1	1	1	1	..	1	2	7	1
32 – 47 ..	1	..	..	..	..	..	4	..	..	..	..	..	..	..	2	1
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	22·0	9·6	14·9	14·3	5·0	19·0	26·9	13·3	9·7	13·6	11·3	10·7	13·0	14·1	20·9	26·7
Total ..	4	9	14	6	1	3	11	3	4	5	6	4	4	7	13	3
	6,000 ft. 0–3 m.p.h. 0 Total cases 37								6,000 ft. 0–3 m.p.h. 3. Total cases 35							
m.p.h.																
4 – 15 ..	1	3	3	4	1	2	3	4	1	3	1	1	1	1	6	6
16 – 31 ..	2	..	..	1	2	3	6	1	1	..	1	..	1	1	5	1
32 – 47 ..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	20·7	7·7	8·0	12·4	19·3	25·0	18·6	11·4	14·5	9·3	11·0	5·0	14·5	14·5	19·9	11·4
Total ..	3	3	3	5	3	6	9	5	2	3	2	1	2	2	13	7
	10,000 ft. 0–3 m.p.h. 0. Total cases 17								10,000 ft. 0–3 p.m.h. 0. Total cases 18							
m.p.h.																
4 – 15 ..	2	..	..	1	1	3	6	1	1	..	..	..	1	..	1	6
16 – 31 ..	1	..	..	..	..	1	1	..	1	..	..	1	..	1	3	3
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	16·0	..	..	10·0	4·0	12·7	15·1	9·0	18·5	..	..	28·0	11·0	31·0	15·5	15·2
Total ..	3	..	..	1	1	4	7	1	2	..	..	1	1	1	4	9

NOTE.—The frequency numbers are actual numbers and not percentages.

TABLE VI.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 MARCH 1934–5								0700 APRIL 1934–5							
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	N.	N.E	E.	SE.	S.	SW.	W.	NW.
	Surface (39 ft. above ground) 0–3 m.p.h. 12. Total cases 52								Surface (39 ft. above ground) 0–3 m.p.h. 22. Total cases 51							
m.p.h.																
4 – 15 ..	3	5	8	3	1	2	9	5	2	2	7	2	..	1	4	4
16 – 31 ..	1	..	..	..	..	..	3	..	2	..	1	1	..	..	2	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed	9·0	5·8	10·6	7·3	12·0	6·0	11·5	7·8	12·7	10·0	11·0	11·3	..	12·0	13·8	10·2
Total ..	4	5	8	3	1	2	12	5	4	2	8	3	..	1	6	5
	1,500 ft. 0–3 m.p.h. 8. Total cases 51								1,500 ft. 0–3 m.p.h: 7. Total cases 49							
m.p.h.																
4 – 15 ..	3	8	7	2	2	1	6	5	2	1	7	4	2	..	6	6
16 – 31 ..	1	..	3	..	..	..	5	..	2	1	2	2	..	..	6	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	12·0	8·8	13·3	5·5	8·0	7·0	15·1	6·2	14·5	12·0	12·2	12·2	4·5	..	15·1	10·9
Total ..	4	8	10	2	2	1	11	5	4	2	9	6	2	..	12	7
	3,000 ft. 0–3 m.p.h. 2. Total cases 52								3,000 ft. 0–3 m.p.h. 3. Total cases 50							
m.p.h.																
4 – 15 ..	1	9	8	0	4	1	2	5	3	2	6	5	1	2	4	7
16 – 31 ..	1	3	5	2	1	..	6	1	1	..	3	..	1	1	6	3
32 – 47 ..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	10·5	13·0	13·7	19·0	8·8	12·0	20·3	10·6	13·2	8·0	13·0	8·8	19·7	17·0	19·6	12·9
Total ..	2	12	13	2	5	1	9	6	4	2	9	5	3	3	11	10
	6,000 ft. 0–3 m.p.h. 2. Total cases 41								6,000 ft. 0–3 m.p.h. 0. Total cases 35							
m.p.h.																
4 – 15 ..	2	4	1	1	1	4	5	5	7	1	..	1	3	2	4	3
16 – 31 ..	..	1	1	1	1	2	7	2	..	..	1	2	..	2	5	1
32 – 47 ..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Mean wind speed.	8·5	11·6	15·5	16·0	21·7	13·0	16·6	13·7	9·1	11·0	17·0	18·0	4·7	17·8	22·2	14·5
Total ..	2	5	2	2	3	6	12	7	7	1	1	3	3	5	11	4
	10,000 ft. 0–3 m.p.h. 0. Total cases 23								10,000 ft. 0–3 m.p.h. 0. Total cases 16							
m.p.h.																
4 – 15 ..	5	2	..	..	..	3	3	1	2	3	..	1	1	..	..	2
16 – 31 ..	..	..	..	..	..	2	3	2	2	..	1	1	..	..	1	2
32 – 47 ..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	2	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	7·2	7·5	..	..	..	21·9	16·6	19·3	14·0	11·3	23·0	12·0	12·0	..	31·8	34·5
Total ..	5	2	..	..	..	7	6	3	4	3	1	2	1	..	3	2

NOTE.—The frequency numbers are actual numbers and not percentages.

TABLE VII.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 MAY 1934–5								0700 JUNE 1934–5							
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	N.	NE.	E.	SE.	S.	SW.	W.	NW.
	Surface (39 ft. above ground) 0–3 m.p.h. 9. Total cases 52								Surface (39 ft. above ground) 0–3 m.p.h. 6. Total cases 44							
m.p.h.																
4 – 15 ..	4	5	7	..	..	..	10	9	3	8	5	4	..	..	8	7
16 – 31 ..	1	1	3	..	..	..	2	1	..	..	..	..	..	..	1	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	10·4	10·5	10·9	..	..	..	13·0	8·5	6·0	7·6	7·8	8·7	..	..	12·5	9·5
Total ..	5	6	10	..	..	..	12	10	3	8	5	4	..	..	10	8
	1,500 ft. 0–3 m.p.h. 9. Total cases 52								1,500 ft. 0–3 m.p.h. 5. Total cases 44							
m.p.h.																
4 – 15 ..	5	4	7	1	..	..	9	6	6	6	4	4	..	..	4	7
16 – 31 ..	1	..	2	..	1	..	6	..	1	..	..	..	..	..	3	9
32 – 47 ..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	11·0	6·5	10·2	7·0	23·0	..	14·4	7·7	7·5	7·7	7·3	9·2	..	..	17·7	11·1
Total ..	6	4	9	1	1	..	16	6	7	6	4	4	..	..	9	9
	3,000 ft. 0–3 m.p.h. 6. Total cases 52								3,000 ft. 0–3 m.p.h. 6. Total cases 44							
m.p.h.																
4 – 15 ..	3	5	5	1	2	2	9	5	6	6	3	1	1	1	6	5
16 – 31 ..	3	1	1	1	1	1	2	3	1	2	..	..	..	..	3	..
32 – 47 ..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	2	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	14·5	11·3	10·9	14·0	12·3	20·3	12·3	15·1	15·7	9·5	6·3	4·0	4·0	5·0	19·3	8·4
Total ..	6	6	6	2	3	4	11	8	8	8	3	1	1	1	11	5
	6,000 ft. 0–3 m.p.h. 3. Total cases 38								6,000 ft. 0–3 m.p.h. 4. Total cases 38							
m.p.h.																
4 – 15 ..	3	2	3	3	2	3	4	4	2	2	3	1	..	3	8	7
16 – 31 ..	..	..	..	..	..	4	3	4	..	2	..	..	..	2	2	..
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	5·3	11·0	10·3	7·7	6·0	13·1	14·6	18·3	8·5	14·5	8·3	5·0	..	16·3	14·4	7·4
Total ..	3	2	3	3	2	7	7	8	2	4	3	1	..	6	11	7
	10,000 ft. 0–3 m.p.h. 0. Total cases 25								10,000 ft. 0–3 m.p.h. 1. Total cases 24							
m.p.h.																
4 – 15 ..	4	..	1	1	3	2	7	1	3	2	2	1	1	..	4	3
16 – 31 ..	..	..	..	..	..	2	1	1	..	..	..	..	..	1	5	..
32 – 47 ..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	1	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	11·0	..	11·0	9·0	15·5	15·7	13·0	22·0	10·3	5·0	7·0	11·0	11·0	24·0	17·4	10·0
Total ..	4	..	1	1	4	4	8	3	3	2	2	1	1	1	10	3

NOTE.—The frequency numbers are actual numbers and not percentages.

TABLE VIII.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 JULY 1934–5								0700 AUGUST 1934–5							
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	N.	NE.	E.	SE.	S.	SW.	W.	NW
	Surface (39 ft. above ground) 0–3 m.p.h. 12. Total cases 53								Surface (39 ft. above ground) 0–3 m.p.h. 15. Total cases 54							
m.p.h.																
4 – 15 ..	4	5	8	1	..	..	12	5	2	1	9	6	1	..	10	8
16 – 31 ..	3	..	2	..	..	..	1	..	..	..	..	..	..	..	..	2
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	12·9	8·2	8·8	7·0	..	..	9·0	7·8	10·0	7·0	7·5	6·5	4·0	..	8·4	9·8
Total ..	7	5	10	1	..	..	13	5	2	1	9	6	1	..	10	10
	1,500 ft. 0–3 m.p.h. 8. Total cases 53								1,500 ft. 0–3 m.p.h. 20. Total cases 54							
m.p.h.																
4 – 15 ..	5	4	7	6	1	..	8	8	2	5	5	3	..	..	8	9
16 – 31 ..	3	..	1	..	..	..	2	..	..	..	..	..	..	..	..	2
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	16·0	8·5	9·3	4·1	4·0	..	10·1	7·4	6·0	5·8	6·4	4·3	..	..	12·1	10·0
Total ..	8	4	8	6	1	..	10	8	2	5	5	3	..	..	8	11
	3,000 ft. 0–3 m.p.h. 7. Total cases 53								3,000 ft. 0–3 m.p.h. 4. Total cases 54							
m.p.h.																
4 – 15 ..	10	5	4	4	1	1	6	5	7	7	3	3	1	3	12	10
16 – 31 ..	5	..	1	..	..	..	2	2	1	1	..	..	..	..	1	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	14·4	8·4	11·8	6·5	9·0	6·0	10·5	10·1	9·0	11·1	7·0	5·0	4·0	4·4	10·4	9·6
Total ..	15	5	5	4	1	1	8	7	8	8	3	3	1	3	13	11
	6,000 ft. 0–3 m.p.h. 2. Total cases 40								6,000 ft. 0–3 m.p.h. 3. Total cases 44							
m.p.h.																
4 – 15 ..	4	7	2	..	2	1	6	7	1	5	2	1	2	4	11	8
16 – 31 ..	2	2	..	..	..	1	2	2	1	2	..	..	..	..	2	2
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	12·2	11·8	6·5	..	13·0	19·0	13·0	13·7	13·0	10·1	11·0	9·0	5·5	8·7	9·2	11·9
Total ..	6	9	2	..	2	2	8	9	2	7	2	1	2	4	13	10
	10,000 ft. 0–3 m.p.h. 0. Total cases 25								10,000 ft. 0–3 m.p.h. 1. Total cases 26							
m.p.h.																
4 – 15 ..	3	..	1	1	1	1	5	8	4	2	1	1	2	2	3	5
16 – 31 ..	..	..	..	..	..	2	1	2	1	..	..	..	1	..	1	2
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	13·3	..	10·0	10·0	15·0	16·0	10·8	11·6	8·4	8·5	8·0	12·0	12·3	5·0	11·2	14·6
Total ..	3	..	1	1	1	3	6	10	5	2	1	1	3	2	4	7

NOTE.—The frequency numbers are actual numbers and not percentages.

TABLE IX.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 SEPTEMBER 1934–5								0700 OCTOBER 1934–5							
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	N.	NE.	E.	SE.	S.	SW.	W.	NW
	Surface (39 ft. above ground) 0–3 m.p.h. 7. Total cases 40								Surface (39 ft. above ground) 0–3 m.p.h. 8. Total cases 34							
m.p.h.																
4 – 15 ..	6	4	8	1	..	1	8	4	..	3	2	1	1	1	13	4
16 – 31 ..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	8·9	8·0	7·3	7·0	..	5·0	10·1	6·7	..	10·7	9·5	15·5	7·0	12·0	8·2	8·3
Total ..	6	4	8	1	..	1	9	4	..	3	2	2	1	1	13	4
	1,500 ft. 0–3 m.p.h. 15. Total cases 50								1,500 ft. 0–3 m.p.h. 6. Total cases 34							
m.p.h.																
4 – 15 ..	5	2	7	4	..	2	6	6	3	2	4	2	..	2	6	5
16 – 31 ..	..	..	..	..	..	..	3	..	..	1	..	1	1	..	1	..
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	6·0	7·0	7·0	7·3	..	7·0	11·2	8·5	7·7	10·7	6·5	15·3	17·0	7·0	9·4	9·0
Total ..	5	2	7	4	..	2	9	6	3	3	4	3	1	2	7	5
	3,000 ft. 0–3 m.p.h. 6. Total cases 50								3,000 ft. 0–3 m.p.h. 4. Total cases 33							
m.p.h.																
4 – 15 ..	9	9	3	4	1	3	7	6	4	6	6	3	..	1	2	3
16 – 31 ..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..
32 – 47 ..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	9·3	6·9	6·0	12·2	5·0	11·7	7·1	9·5	11·7	8·3	9·3	7·3	..	26·0	4·5	7·3
Total ..	9	9	3	5	1	4	7	6	6	6	6	3	..	3	2	3
	6,000 ft. 0–3 m.p.h. 4. Total cases 34								6,000 ft. 0–3 m.p.h. 1. Total cases 25							
m.p.h.																
4 – 15 ..	4	..	5	2	1	4	4	6	1	3	3	2	2	3	5	2
16 – 31 ..	..	..	..	..	..	3	1	..	1	..	..	..	..	..	..	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Mean wind speed.	7·0	..	6·8	7·0	14·0	14·1	10·4	8·5	15·0	9·0	7·7	7·5	10·5	22·0	8·2	10·7
Total ..	4	..	5	2	1	7	5	6	2	3	3	2	2	4	5	3
	10,000 ft. 0–3 m.p.h. 0. Total cases 19								10,000 ft. 0–3 m.p.h. 1. Total cases 15							
m.p.h.																
4 – 15 ..	2	1	..	2	1	2	4	2	..	1	..	1	2	1	3	3
16 – 31 ..	..	..	1	..	1	1	2	..	..	..	..	..	..	..	1	2
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	10·5	15·0	25·0	8·5	16·5	10·3	11·2	6·0	..	8·0	..	5·0	12·5	4·0	13·7	11·8
Total ..	2	1	1	2	2	3	6	2	..	1	..	1	2	1	4	5

NOTE.—The frequency numbers are actual numbers and not percentages.

TABLE X.—FREQUENCY SUMMARY OF SURFACE AND UPPER WINDS

Speed	0700 NOVEMBER 1934–5								0700 DECEMBER 1934–5							
	N.	NE.	E.	SE.	S.	SW.	W.	NW.	N.	NE.	E.	SE.	S.	SW.	W.	NW.
	Surface (39 ft. above ground) 0–3 m.p.h. 5. Total cases 25								Surface (39 ft. above ground) 0–3 m.p.h. 11. Total cases 43							
m.p.h.																
4 – 15 ..	2	1	4	..	1	..	3	7	1	1	8	4	..	5	6	4
16 – 31 ..	..	..	1	..	..	..	1	..	..	..	3	..	..	..	..	..
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	9·5	12·0	10·2	..	7·0	..	11·0	7·7	4·0	12·0	11·9	7·5	..	6·6	6·7	8·3
Total ..	2	1	5	..	1	..	4	7	1	1	11	4	..	5	6	4
	1,500 ft. 0–3 m.p.h. 0. Total cases 25								1,500 ft. 0–3 m.p.h. 5. Total cases 43							
m.p.h.																
4 – 15 ..	3	4	6	2	1	..	1	4	3	6	5	2	2	3	4	2
16 – 31 ..	..	..	2	1	..	..	..	1	..	..	7	1	1	1	1	..
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	11·0	9·0	11·5	13·0	4·0	..	7·0	11·8	8·3	7·5	10·7	12·3	13·0	10·5	14·2	4·5
Total ..	3	4	8	3	1	..	1	5	3	6	12	3	3	4	5	2
	3,000 ft. 0–3 m.p.h. 0. Total cases 24								3,000 ft 0–3 m.p.h. 2. Total cases 42							
m p.h.																
4 – 15 ..	4	5	5	1	..	1	1	3	3	5	6	1	..	2	2	1
16 – 31 ..	..	..	2	..	1	..	..	1	1	3	6	2	..	1	5	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed	8·7	13·2	14·4	10·0	23·0	4·0	4·0	12·0	9·5	15·9	16·3	17·0	..	11·0	23·0	13·0
Total ..	4	5	7	1	1	1	1	4	4	8	12	3	..	3	8	2
	6,000 ft. 0–3 m.p.h. 1. Total cases 19								6,000 ft. 0–3 m.p.h. 0. Total cases 35							
m.p.h.																
4 – 15 ..	3	..	2	1	2	..	3	4	2	7	3	1	2	6	2	1
16 – 31 ..	..	..	1	1	1	..	..	..	..	..	1	..	4	..	4	1
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed	8·3	..	10·7	11·5	15·7	..	8·7	7·5	9·0	10·8	12·7	13·0	18·3	14·0	18·2	14·5
Total ..	3	..	3	2	3	..	3	4	2	7	4	1	6	7	6	2
	10,000 ft. 0–3 m.p.h. 1. Total cases 16								10,000 ft. 0–3 m.p.h. 0. Total cases 22							
m.p.h.																
4 – 15 ..	2	..	..	1	3	2	2	1	1	..	1	1	1	2	4	1
16 – 31 ..	..	..	..	..	1	1	..	2	..	1	..	..	2	1	4	3
32 – 47 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48 and over	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean wind speed.	2·0	..	..	8·0	13·7	12·7	13·5	17·7	8·0	19·0	4·0	6·0	20·0	12·7	17·9	21·7
Total ..	2	..	..	1	4	3	2	3	1	1	1	1	3	3	8	4

NOTE.—The frequency numbers are actual numbers and not percentages.

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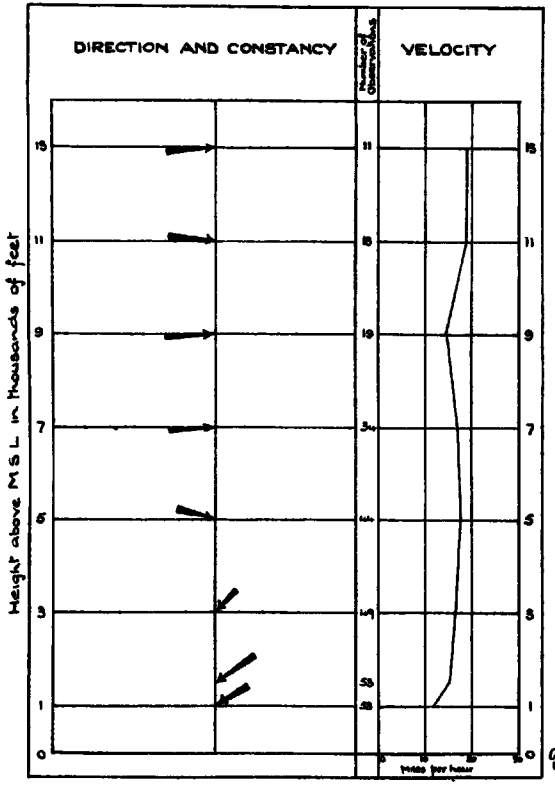
FIG. 3 JANUARY 1934-5



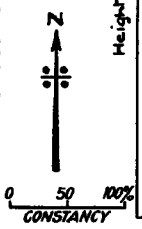


FIG. 4 FEBRUARY 1934-5

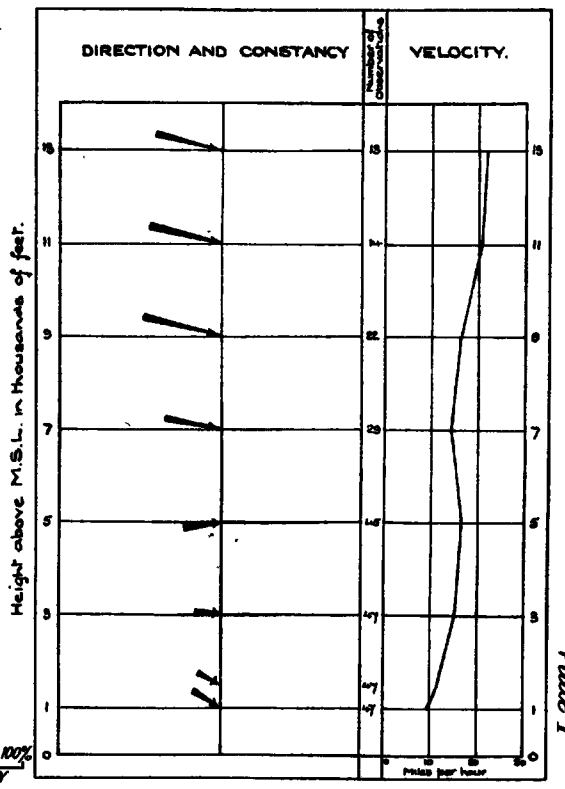
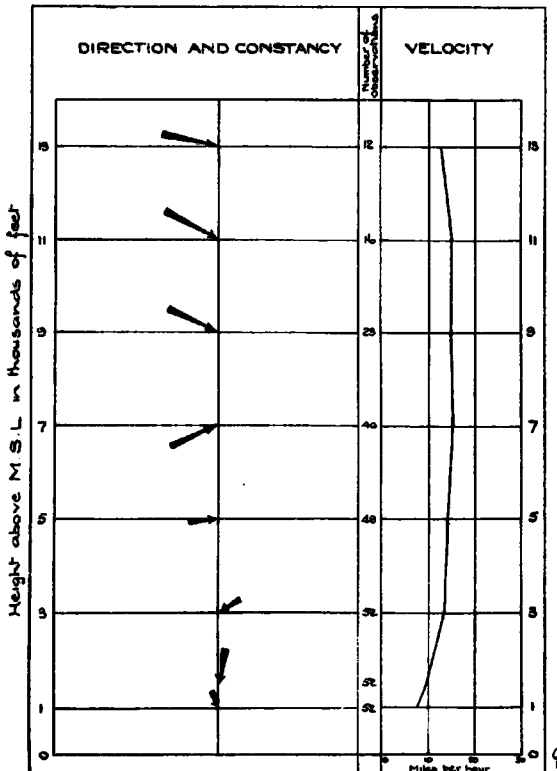


Plate I

The constancy of the wind is indicated by the length of the direction arrow.

FIG. 5 **MARCH** 1934-5



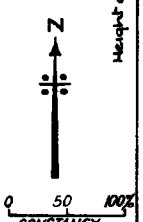


FIG. 6 **APRIL** 1934-5

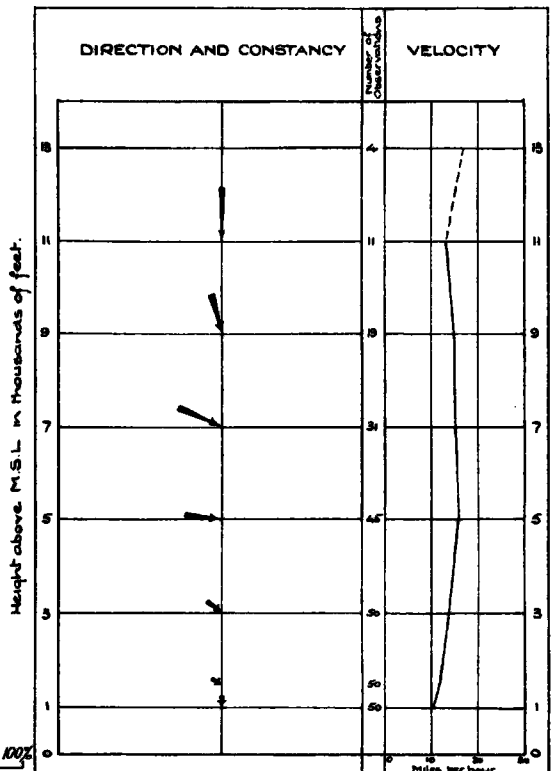


Plate II

The constancy of the wind is indicated by the length of the direction arrow.

FIG. 7 MAY 1934-5

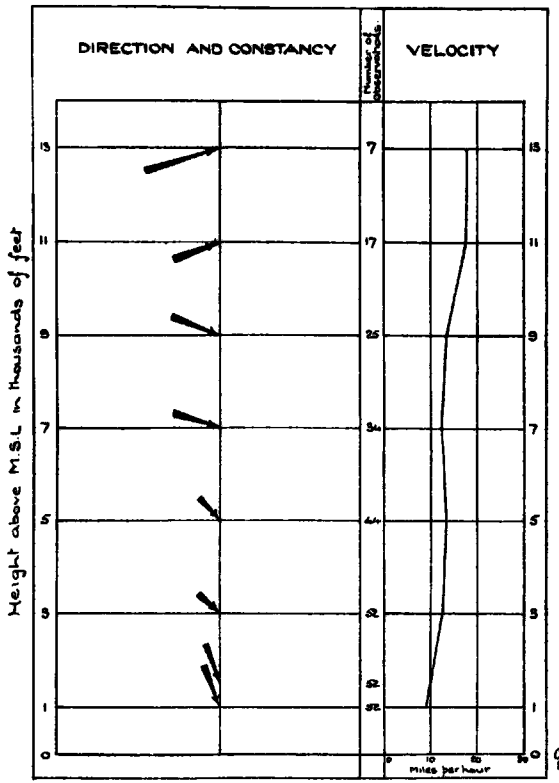


FIG. 8 JUNE 1934-5

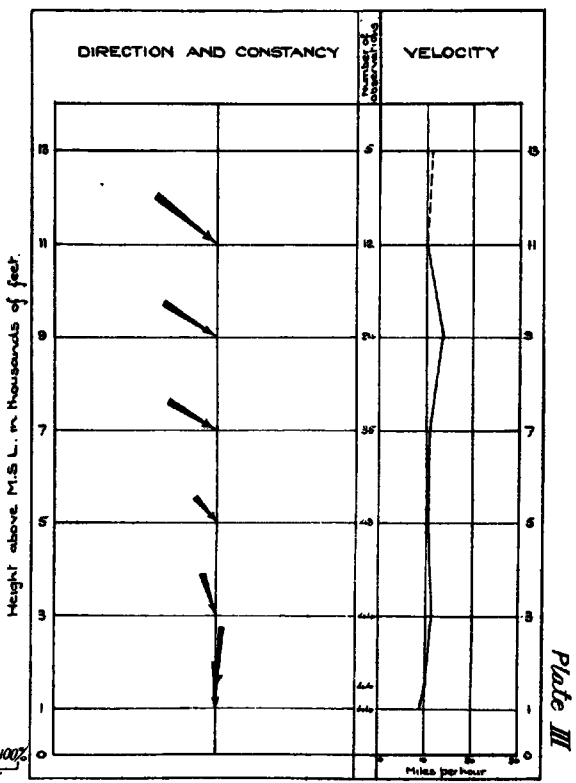


Plate III

The constancy of the wind is indicated by the length of the direction arrow.

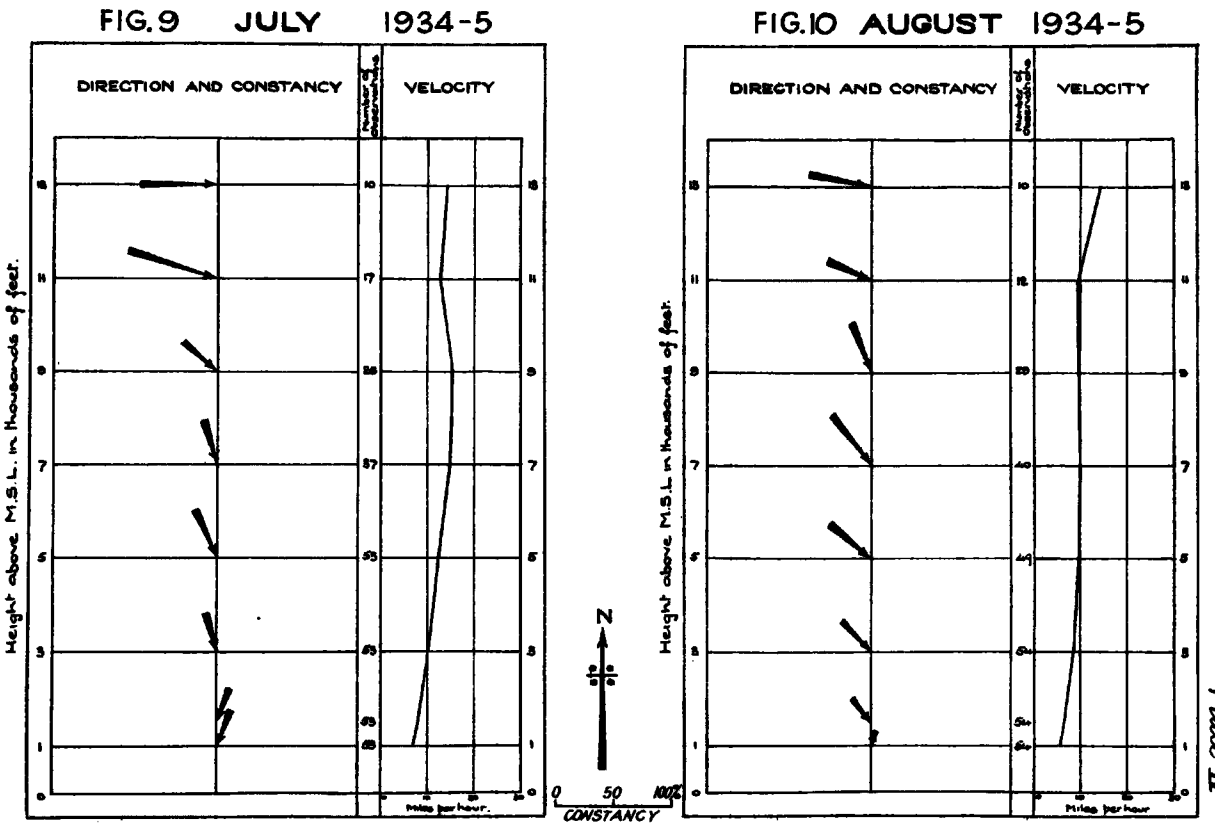


Plate IV

The constancy of the wind is indicated by the length of the direction arrow.

FIG. 11 SEPTEMBER 1934-5

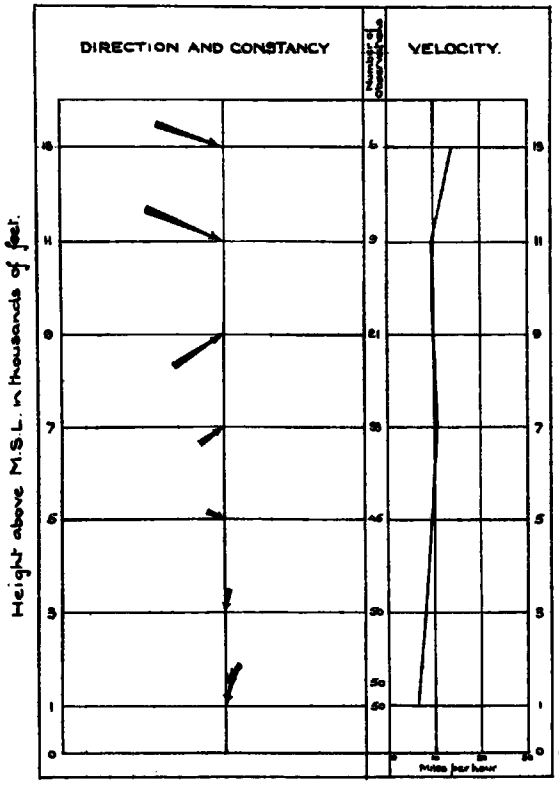


FIG. 12 OCTOBER 1934-5

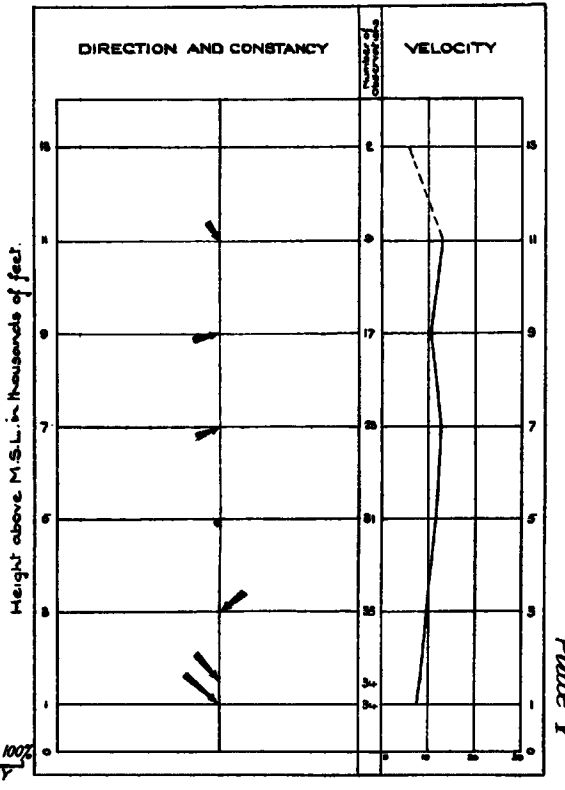
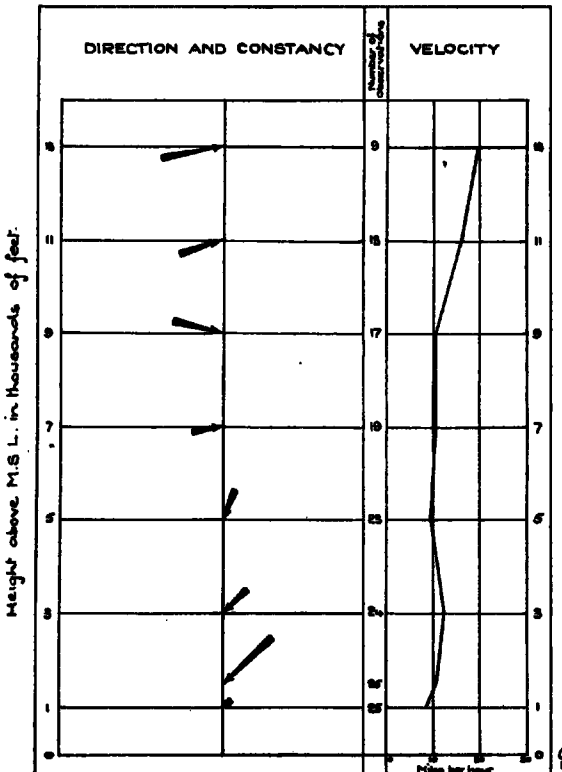


Plate V

The constancy of the wind is indicated by the length of the direction arrow.

FIG. 13 NOVEMBER 1934-5



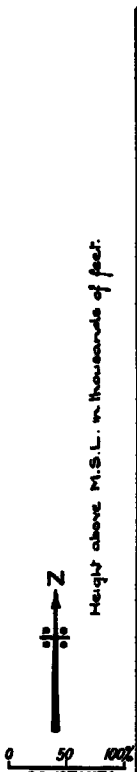


FIG. 14 DECEMBER 1934-5

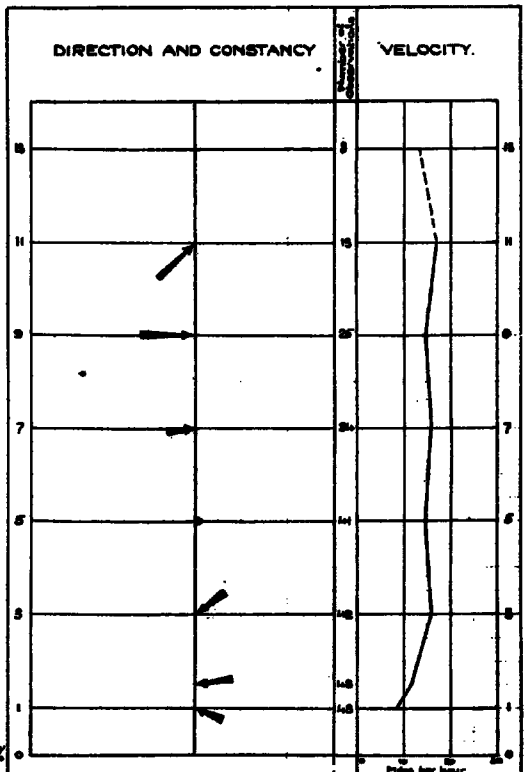


Plate VI

The constancy of the wind is indicated by the length of the direction arrow.